INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1994	**Park:** Shenandoah NP
Principal Investigator: Julia Thomas	**Office Phone:** (703)999-3499 **Email:** n/a
Address: National Park Service Shenandoah National Park Rt. 4, Box 348 Luray, Virginia 22835-9051	**Office Fax:** n/a

Additional investigators or key field assistants (first name, last name, office phone, office email):

Name: Mr Shane Spitzer	**Phone:** n/a	**Email:** n/a
Name: Mr Rolf Gubler	**Phone:** n/a	**Email:** n/a

Permit#:
SHEN1994AJKR

Park-assigned Study Id. #:
unknown

Project Title:
Gaseous Pollutant, Visibility, and Rainfall Monitoring

Permit Start Date: Jan 01, 1998	**Permit Expiration Date** Jan 01, 1998
Study Start Date: Jan 01, 1994	**Study End Date** Jan 01, 1994

Study Status:
Completed

Activity Type:
Other

Subject/Discipline:
Air Quality

Objectives:
Study long-term effects of air pollution:;1) Monitor air quality at SNP including gaseous pollutants, visibility, and rainfall chemistry.;2) Coordinate air pollution studies related to NPS and other ; government agencies with emphasis on evaluating air pollution effects on park resources.

Findings and Status:
All USGS Interstate Comparison Studies on the rainfall collection performed since the projects conception have passed quality assurance checks except during July 1984, and May 1994 (due to a known faulty pH meter, follow-up tests passed after meter repair). These results are excellent.;The annual average rainfall pH since 1981 has ranged from 4.51 to 4.58. However, the summertime average rainfall pH has fallen from 4.48 to 4.32. Because pH is a logarithmic measurement, these ranges are approximately ten times more acidic than normal rainfall (pH 5.2 to 5.6). Data from 1994 will not be available until March.;The number of summer days with moderate ozone levels (50-79 ppb) have steadily increased by 25 percent during the last four years. Days with low ozone levels (less than 50ppb), have decreased the last four years by 17 percent. SO2 was not monitored after January 1993, because levels had remained essentially the same throughout the period monitored (the particulate monitoring and the rainfall monitoring reveals more reliable information about sulfur concentrations and deposition). No EPA standards for ambient SO2 or ozone were violated in the park in 1994.;A preliminary analysis of visibility data which uses three categories of site distance - good, fair, and poor - shows a 7 percent increase in good visibility days. Both poor and fair visibility days decreased slightly. From 1991 to 1993, poor visibility days increased, fair visibility days decreased, and good visibility days remained steady (until the 1994 increase).;Sulfate monitoring (IMPROVE) still shows the concentrations at SNP to be among the highest in the country. Sulfur particle concentrations in the summertime have increased four percent from 1982 through 1992.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?
No

Funding provided this reporting year by NPS:	**Funding provided this reporting year by other sources:**

36700	0

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0